

---

**Attention Deficit Hyperactivity Disorder and Impulsivity in adults**  
**With Substance Use Disorder:**  
**Implications for understanding and treatment**

---

A thesis submitted in partial fulfilment of the requirements for the Degree of

Master of Science in Psychology

with the Department of Psychology, University of Canterbury

under the supervision of

Professor Martin Dorahy and Dr Juan Canales

---

By Suzanne McLaughlin

2016

---

## **Acknowledgements**

There are many people to whom I extend my heartfelt thanks to for their role in supporting me through this project.

To my senior supervisor – Martin Dorahy, and my secondary supervisor – Juan Canales, thank you for sharing your knowledge, time and energy with me. I appreciate your input immensely.

Thank you to the staff at alcohol and drug facility for allowing me to work with the residents, and for providing a space for me.

A huge thank you to all my dear friends and family – Karin, Shelley, Sharmaine and Brian, Robert, Debra, Tim, and Rosemary for continually supporting and encouraging me. And most of all, thank you for believing in me. I could not have made it this far without you all.

To the participants – thank you for taking part in this study, and sharing your experiences.

Without you, this research would not exist.

To my son Ethan. Thank you for putting up with me, or should I say the lack of ‘me’ at times.

I appreciate you all for helping me reach this goal.

## Table of Contents

Acknowledgements .....	2
Table of Contents .....	3
List of Tables .....	5
Abstract .....	6
Introduction .....	7
<i>Substance Use</i> .....	7
<i>Impulsivity</i> .....	9
<i>ADHD</i> .....	13
<i>The Current Study</i> .....	17
Method .....	19
<i>Participants</i> .....	19
<i>Medication</i> .....	23
<i>Substance of Choice</i> .....	24
<i>Measures</i> .....	24
<i>Procedure</i> .....	27
<i>Analysis</i> .....	28
Results .....	30
<i>Impulsivity</i> .....	30
<i>ADHD</i> .....	31
Discussion .....	33
<i>Strengths and Limitations</i> .....	35
<i>Considerations for future research</i> .....	36
<i>Implications for SUD assessment and treatment</i> .....	36
<i>Conclusion</i> .....	36
References .....	38

Appendix A .....	43
Appendix B .....	45
Appendix C .....	47
Appendix D .....	48
Appendix E .....	49
Appendix F .....	50
Appendix G .....	54

## **List of Tables**

Table 1 – Demographic Characteristics .....	20
Table 2 – Medications .....	23
Table 3 – Substance of Choice .....	24
Table 4 – Impulsive Behaviour .....	30
Table 5 – ADHD Symptoms .....	31

## **Abstract**

Alcohol and drug addiction have widespread detrimental effects, and physical and psychological costs on individuals, families, communities and society. There is accumulating evidence suggesting that impulsive behaviours (urgency/delay discounting, lack of premeditation/thought, lack of perseverance and sensations seeking/risk taking) and the symptoms of Attention Deficit Hyperactivity Disorder (inattention, hyperactivity and impulsivity) are connected to problematic alcohol and drug use. However, there is little research on impulsivity and disorders of Attention Deficit Hyperactivity Disorder (ADHD) in Substance Use Disorder (SUD). This study assessed 23 adult men in residential treatment in Christchurch (New Zealand) for SUD and 23 males aged-matched non-SUD controls on measures of impulsivity (UPPS-P Impulsive Behavior Scale) and ADHD (the Adult ADHD Self-Report Scale ASRS-v1.1 Symptom Checklist) symptoms. Those with SUD reported significantly higher impulsivity and ADHD symptomology, suggesting a link between these constructs and drug addiction. Overall, these findings provide much needed research into the prevalence of impulsivity and ADHD symptoms on drug addiction and those with a diagnosis of SUD.

## **Introduction**

### **Substance Use**

Drug addiction affects the lives of many people and without discrimination of social class, education, gender or race. Some individuals caught in drug addiction lose their family and friends, their livelihood, homes and possessions, and some even lose their lives. Prolonged use of drugs can lead to not only an increased tolerance and clinical addiction for the drug, but also the desire to carry out various rituals associated with the drug use (Friedman, Dar, & Shilony, 2000). Once the addiction reaches a clinical level, a compromise in personal boundaries and moral behaviours are often seen, along with diminished self-care and self-control. Once drug use becomes addictive it takes over everything that was previously important: children, partners, family members, friends, health and self-care all become second to the drug (el-Guebaly, Mudry, Zohar, Tavares, & Potenza, 2011).

The notion that someone with an addiction could have an “addictive personality” has gained much publicity. However, there is no solid and consistent evidence to support this theory (Kerr, 1996). There is no unique constellation or specific personality profile that predisposes an individual to becoming addicted to drugs. Kerr (1996) confers that compulsiveness is important to consider in addiction, since there is no personality type that fits a person addicted to alcohol or drugs, and free choice is seen to be involved in drug use. Impulsivity is also considered to be a critical factor in models of addiction along with other disorders also linked to impulse deficits (Lui, Vassileva, Gonzalez, & Martin, 2012).

A model of addiction that now receives very little attention is the moral model. This model views drug addiction as a choice whereby the drug addicted individual is in full control of their choices and their behaviour is completely voluntary. This view does not explain why addiction involves the continuation of the drug taking behaviour despite the detrimental and adverse consequences, and sincere desire to stop (Kerr, 1996). It has been argued that compulsivity is the central feature of addiction and that it demonstrates an inability for freedom of choice or will (Kerr, 1996). However, all behaviours have an element of biology and compulsivity is easily seen through the observation of particular behaviours that involve voluntary actions (Heyman, 2013).

Izquierdo and Jentsch (2012) found that difficulty in disengaging from an ongoing behaviour reflected a tendency for habitual or compulsive responses and that over time the effects of using drugs can become more habitual, compulsive, and less pleasurable. The two prominent models used today are the psychological model and the medical model (Eysenck, 1997). The medical model defines addiction as a mental disorder (Hendon, Melberg, & Rogeberg, 2013) which is in alignment with the description of addiction in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5: American Psychiatric Association, 2013).

The DSM-5 lists addiction as Substance Use Disorder (SUD). It states that drugs intensely activate the reward centre of the brain which reinforces the drug taking behaviour. Individuals that have low levels of self-control, reflected as an impairment of the brain's inhibitory mechanisms, may have an increased disposition to developing a SUD. The DSM-5's definition of addiction, consistent with the medical model, confers that drug addiction is a disease that is characterised by little to no control over the compulsive use of a drug, resulting in



recurrent relapse (Henden et al., 2013). However, the problem with the medical model is that it is based in scientific methods and is really only able to incorporate phenomena that is measurable and quantifiable (Zigmond, 2012).

The psychological model is a theory that explains specific psychological processes, predicts outcomes, and looks at the emotional and cognitive processes that motivate our behaviour (Ashar et al., 2016). However, on their own, the psychological and medical model do not explain or encompass all aspect of human functioning and behaviour. Therefore, both models are useful to incorporate when working with addiction. One aspect of behaviour – impulsivity has been associated with illicit drug use and is worthy of further research. Impulsivity is well documented and researched as a construct implicated in the use of drugs and drug addiction (Weafer & Wit, 2013). The personality facets of impulsivity have been thoroughly researched and have also been shown to be a very prominent feature of Attention Deficit/ Hyperactivity Disorder (ADHD) (Fernando et al., 2011).

## **Impulsivity**

Although drug addiction may appear compulsive, for some, their drug use could be motivated by a desire to eliminate or reduce feelings of stress and anxiety (el-Guebaly et al., 2011). Yet for others it may be due to deficits in their decision making or a lack of control over their impulses. Li et al., (2012) reported that there are marked differences in the characteristics between control users and substance users with research showing a high score for impulsivity in substance users. The research also found that impulsivity is a high-risk factor for the onset and early use of substances, and is correlated to treatment retention and the severity of drug use.

Li et al. (2012) also reported that some studies have found that impulsivity was significantly and positively correlated to the quantity of illicit drugs used in a lifetime, while the age of using a substance for the first time was negatively correlated to impulsivity measures. Impulsivity has been broadly understood as a predisposition for rapid and unplanned reactions to stimuli (both internal and external) without regard to negative consequences for oneself or others (Liu et al., 2012). Consequently, impulsivity leads to an array of problems with regards not only to impulsive drug taking but also when it comes to other high risk activities.

By definition, impulsivity is defined as encompassing two elements – impulse action and impulse choice. Impulse action involves the inability to withhold a response which reflects poor response inhibition, whereas impulse choice involves an elevated preference for instant gratification over a more beneficial delayed reward (Brevers et al., 2012). In drug addicted individuals, impulsive action is demonstrated by a difficulty inhibiting or controlling a response (i.e., to not take a drug in the moment it is made available); and impulse choice is displayed by a difficulty delaying gratification (i.e., not take the drug on offer right now for the prospect of having better health, relationships and happiness in the future; Weafer & Wit, 2013).

Controlled decision making requires the ability to exert inhibitory control over impulsive responding. However, it is not common practice for all people to deliberately and carefully consider all of the pros and cons of an action before taking it, and especially not those with an impulsive disposition (Kerr, 1996). In studies on impulsivity using intertemporal choice tasks, impulsive choice can be measured. In these tasks, participants have to make a choice between an immediate but small reward and a delayed but larger reward. Greater impulsive choice has been repeatedly reported in those with substance use disorders. Moreover, in animal studies, a pre-

existing impairment in impulsive choice has been shown to predispose its subjects to higher quantities of cocaine self-administration and of reinstatement of drug-seeking behaviour.

Impulsive choice appears to be associated with selection biases towards the immediate reward (drug) rather than the longer term benefits that are associated with health, family or employment (Voon et al., 2010). A study by Moody, Franck, Hatz, and Bickel (2016) researched the relationship between the use of multiple drugs and the rate of delay discounting (reduced estimate of future rewards i.e., wanting it now), an indicator of impulsivity. They reported that 80 percent of drug users regularly use more than one drug, and found that substance users have far higher discounting rates compared to non-substance users, with the rate of discounting increasing with the number of substances regularly used.

Liu et al. (2012) also found that higher discount rates are consistently found amongst substance users. A study that measured specific impulsive behaviours of delay discounting and risk-taking, reported that both of these constructs are highly associated with drug use (Bornovalova, Daughters, Hernandez, Richards, & Lejuez, 2005). Another study found similar results where dependent Marijuana users which demonstrated a tendency toward increased delay discounting on impulsiveness scales when compared to controls (Gruber, Silveri, Dahlgren & Todd, 2011). It is well researched that impulsivity plays a large role in drug use, showing that those with SUD tend to go for immediate although smaller rewards rather than delayed larger rewards (Torok, Darke, & Kaye, (2012).

Research on chronic smokers of Marijuana found that participants who had use of Marijuana early in their lives also demonstrated an increase in impulsivity compared to the control participants. This increased level of impulsivity may have contributed to the initial use of Marijuana or the inability to discontinue using the substance (Gruber et al., 2011). A further

indicator of impulsivity - sensation seeking, has also been seen to play a crucial role when it comes to susceptibility to alcohol and drug use. It has been found that for those who tested as high sensation seekers, the use of alcohol was twice as high as that of low sensation seekers.

Sensation seeking has been defined as a trait which involves seeking complex, novel, varied, and intense experiences and sensations, along with the willingness to have experiences that may involve social, legal, physical and financial risks (Donohew, Zimmerman, Cupp, Novak, Colon, & Abell, 2000). In research conducted by Donohew et al., (2000) it was found that individuals with high levels of sensation seeking were found to be receptive to stimuli, both internal and external, that is intense, novel and arousing. Other stimuli that produces arousal at lower levels is considered 'boring' and may result in the high sensation seeker looking for alternative sources of stimulation. Low sensation seekers tend to look for stimuli that is less intense and arousing, and preferring familiar and less complex stimuli.

It has been found that sensation seeking is highly related to impulsivity, particularly with the lack of planning and forethought, and risk taking, hence making the high sensation seeker more likely to engage in alcohol and drug use (Donohew et al., 2000). Numerous studies have shown that drug use is related to a reduction in cognitive functioning, and specifically with behavioural inhibition (Gruber et al., 2011). Given that impulsivity is a prominent feature of addiction involving poorly conceived risky actions that are prematurely expressed and resulting in undesirable outcomes, highlights the importance for a requirement of further research and potential treatment strategies in this field (Izquierdo & Jentsch, 2012).

## **ADHD**

Impulsivity as a construct on its own has been related to a number of psychiatric disorders, furthermost and markedly ADHD (Fernando et al., 2011). ADHD has become a more commonly recognised childhood behavioural disorder and is characterised with chronic problems of hyperactivity, inattention, and impulsivity (Glass & Flory, 2012). Given that functional impairments academically and socially are commonly associated with ADHD, it is found that this may consequently lead to involvement in deviant behaviour and drug use. It has been found that children with ADHD have an increased risk of alcohol abuse and dependence in adulthood. It has also been found that those with childhood ADHD have higher tolerance and larger use of alcohol and other drugs in their adolescence (Molina, Walther, Cheong, Pedersen, Gnagy, & Pelham, Jr, 2014).

Many children with the symptoms of ADHD go undiagnosed, untreated and unmanaged, and with these symptoms persisting into adolescence and adulthood, they are far more likely to develop SUD (Kaye et al., 2013). With the symptoms of ADHD first manifesting in childhood, it has been found that in 70% of cases the behaviours of ADHD persist into adulthood (Torok et al., 2012). Research has shown that those with a diagnosis of childhood ADHD persisting into adulthood, have a 52% higher chance of developing an addiction to drugs (Matthys, Joostens, Stes, Tremmery, & Sabbe, 2013). There has been some research that suggests treatment for ADHD in children may produce a beneficial effect when it comes to the prevention of a drug addiction later in life (Garcia, 2013). However approximately only 4% of the general adult population are diagnosed with ADHD, and it is estimated that this figure would be three times higher amongst adult substance users (Torok et al., 2012).

With a diagnosis of ADHD, individuals with a co-existing diagnosis of SUD, have an ongoing and persistent problem with drug use. More research is required in order to accurately diagnose individuals who possibly have an untreated diagnosis of ADHD along with a diagnosis of SUD. It has been found that it is difficult to make an accurate diagnosis in individuals that are not fully abstinent as the symptoms of ADHD can be exacerbated by illicit drug use. There is research that indicates that observation as well as a formal assessment (i.e., diagnostic scales), is required for adequate detection of ADHD for drug users. In the study by Matthys, Joostens, Stes, Tremmery, and Sabbe (2013) it was found that there was a significant difference between those addicted to drugs that were in treatment, and those that were not being treated, when it came to the possibility of diagnosing and treating the symptoms of ADHD.

A study of cocaine users seeking treatment showed that 35% of participants met the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR: American Psychiatric Association, 2000) criteria for ADHD, and close to one in four with a SUD also had ADHD (Keith, Rapgay, Theodore, Schwartz, & Ross, 2015). ADHD is associated with earlier onset and greater severity of SUD and as with other disorders, there is a tendency to self-medicate to alleviate or manage the symptoms (Kaye, Darke, & Torok, 2013). It has been well documented that ADHD is associated with SUD and it is estimated that among the population of those with SUD, 23% also meet criteria for ADHD (Kaye et al., 2013).

In Kaye et al.'s (2013) study, 45% of participants with SUD screened positive for ADHD. Only 17% had been previously diagnosed as having ADHD. It is plausible that those with ADHD are under identified amongst those diagnosed with SUD, and research has shown that those with SUD are seldom concurrently diagnosed with ADHD leaving the symptoms

untreated and unmanaged (Kessler et al., 2006). A further implication of ADHD symptoms is the affect they have on the frequency of drug taking and quantity of drugs used.

Research by Horner, Scheibe, and Stine (1996) looked at the link between ADHD and cocaine use, and found that participants with higher scores for ADHD used higher quantities of cocaine and self-medicated due to the initial therapeutic effect. Unfortunately, this therapeutic affect does wear off and a dependence is formed along with the requirement for a remedy for the negative symptoms associated with withdrawal. In treatment settings some of the main symptoms of ADHD such as impulsivity, impatience and poor organisational skills, results in frequently missed appointments, inconsistencies in treatment, and repeated relapses, all of which interfere with recovery (Keith et al., 2015). This can make working with these individuals far more challenging for Alcohol and Other Drug (AOD) practitioners and consequently treatment is far less effective.

It is also worth noting that the main symptoms of ADHD such as poor concentration, limited attention span, restlessness, impulsivity and frustration, interfere with SUD treatment (Horner et al., 1996). These symptoms of ADHD can also be enhanced by withdrawals and cravings for drugs, making a sound diagnosis and treatment particularly problematic, especially when the individual is not fully abstinent (Matthys et al., 2013). When treating an individual for long term sobriety or abstinence, it is also important to consider if the symptoms of ADHD, specifically the impulsivity, were present prior to using drugs, or whether it is a product of the affects of a drug addiction (Weafer & Wit, 2013).

A well-designed study by Kaye et al. (2013) confirmed that ADHD is a frequent comorbid disorder with not only those being treated for SUD, but also in those using psychostimulant drugs. In this study 50% of those using psychostimulant drugs who were not

receiving treatment, screened positive for ADHD. The results demonstrate the importance of screening for ADHD for those with SUD, and also for those that are not receiving treatment. Considering there is a threefold increase in prevalence of ADHD symptoms among drug users, there are some important issues that arise, such as the self-medication of those with ADHD symptoms who have a SUD and use illicit psychostimulants.

This information raises the questions of what comes first, the ADHD or the SUD? Could it be that the SUD was preventable if ADHD was diagnosed and treated at an early stage? Moreover, if safe ADHD treatment (either pharmacological or psychological) was currently available, would it reduce the development of a SUD? Evidence does show that an ADHD diagnosis is frequently overlooked and is not commonly diagnosed among SUD patients. So if ADHD does go hand-in-hand with the development of a SUD, under-diagnosing or not diagnosing ADHD could be highly detrimental (Garcia, 2013).

Presently there is no evidence-based strategies for treating ADHD when recovering from SUD (Keith et al., 2015); however, a study by Matthys et al. (2013) has shown there have been positive outcomes for residential patients with coexisting disorders of ADHD and SUD using non-pharmacological treatment methods. This is promising and highlights the importance of continuing research in this area. However, it has been found that individuals in recovery programs with co-occurring ADHD and SUD, have higher rates of failure when it comes to completing treatment (Keith et al., 2015). There is difficulty with the treatment of SUD for those with the symptoms of ADHD, with higher rates of relapse. It is important to be aware of the impact of compliance to treatment strategies and relapse prevention when it comes to potentially the undiagnosed and untreated symptoms of ADHD.



## **The Current Study**

To date there is no routine screening in New Zealand for ADHD amongst those presenting with drug addiction issues. Very little is still known about the impact of adult diagnoses of ADHD along with SUD, and those who regularly use illicit drugs (Torok et al., 2012). However, impulsivity and the tendency to engage in risky behaviours has been repeatedly shown to be implicated in illicit drug use (Bornovalova et al., 2005). This study explored if impulsivity and symptoms of ADHD were related to SUD using only male adults in an AOD residential rehabilitation facility. All residents in the AOD facility were abstinent from drug use as verified by regular drug testing, however the study focussed on their patterns of behaviour prior to them beginning treatment.

Given so much research has already shown increased impulsivity in SUD, it is important to look at the aspects of impulsivity: negative urgency, lack of premeditation, lack of perseverance, sensation and positive urgency (Lynam, Smith, Whiteside, & Cyders, 2006). Impulsivity is only one of the aspects of ADHD however all the aspects of impulsivity are not encompassed or explained by a diagnosis of ADHD alone, therefore requiring further investigation.

Understanding the connection between impulsivity, ADHD and SUD has important and relevant implications into the prevention and intervention of drug addiction. There is still little research into diagnostic tools for the proper detection of patients with co-existing disorders of ADHD and SUD. There is a lack of research on treatment strategies for those with coexisting disorders of ADHD and SUD. It is hoped that this study will provide useful information that may improve diagnostic tools and treatment strategies in the future, and provide further research into this area.

The intention of this research is to extend previous studies conducted in the area of substance use, impulsivity, comorbid diagnoses of ADHD in SUD, along with important demographic factors. It is anticipated that this research will increase knowledge and detection of co-existing disorders and personality deficits and thus guide treatment strategies. The main hypotheses of the current study are:

- (1) A history of more than two years of alcohol or drug use and a current diagnosis of SUD is related to higher rates of impulsivity as determined by the UPPS-P Impulsive Behavior Scale (Lynam et al., 2006) on the subscales of negative urgency, lack of premeditation, lack of perseverance, sensation and positive urgency.
- (2) A history of more than two years of alcohol and drug use and a current diagnosis of SUD is related to higher rates and severity of ADHD symptoms as determined by the Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist (Kessler et al., 2005).

It is expected that the findings will show higher scores in all the subscales for impulsivity and higher scores for ADHD symptoms for the drug group when compared to the control group of non-drug users.

## **Method**

### **Participants**

Participants in this study were 46 men aged between 20 and 47 years old who were either in the control group (recruited from the general public) or the drug group (in residential treatment for SUD). The sample consisted of only males as the AOD rehabilitation centre that was agreeable to this research being conducted on their patients, was a male only facility. Therefore, only male control subjects were sought and included in this study.

Potential participants for the control group were verbally screened before partaking in this study. They were screened for involvement in AOD services in any capacity, and if they had a history of or currently used alcohol or drugs. If they had a history of use and if they used alcohol regularly i.e., more than 2-3 days per week, they were informed they did not meet criteria for the study. If there was any doubt of alcohol or drug use, they were not asked to participate in this study.

Exploratory data analysis was run for age which provided the mean, standard deviation, percentage, number, and the minimum and maximum age along with the age range. The sample demographics as presented in Table 1, reflect that the participants in both groups were of similar age, ethnicity and marital status, however there were considerable differences in education.

Table 1

*Group comparisons on Demographic Characteristics*

Variable	Control N (%)	Drug N (%)	Total N (%)
N	23	23	46
Gender			
Male	23 (50%)	23 (50%)	46 (100%)
Female	0	0	0
Age			
In years, M (SD)	33.22 (8.141)	33.26 (7.978)	
Range	20-47	20-46	
Ethnicity			
NZ European	14 (30.4%)	16 (34.8%)	30 (65.2%)
NZ Maori	2 (4.3%)	5 (10.9%)	7 (15.2%)
European	5 (10.9%)	1 (2.2%)	6 (13.0%)
Other	2 (4.3%)	1 (2.2%)	3 (6.5%)
Marital status			
Single	11 (23.9%)	15 (32.6%)	26 (56.5%)
Married / De-facto	8 (17.4%)	3 (6.5%)	11 (23.9%)
In relationship	4 (8.7%)	5 (10.9%)	9 (19.6%)
Education			
Did not complete High School	0 (0.0%)	7 (15.2%)	7 (15.2%)
Completed High School	1 (2.2%)	3 (6.5%)	4 (8.7%)
School Certificate / NCEA1	6 (13.0%)	7 (15.2%)	13 (28.3%)
Certificate	3 (6.5%)	5 (10.9%)	8 (17.4%)
Diploma	4 (8.7%)	1 (2.2%)	5 (10.9%)
Degree	6 (13.0%)	0 (0.0%)	6 (13.0%)
Masters	3 (6.5%)	0 (0.0%)	3 (6.5%)

*Note. NZ refers to New Zealand.*

The participants in the control group ( $N = 23$ ) were aged between 20 and 47 years old with a mean age of 33.22 ( $SD = 8.14$ ), and the participants in the drug group ( $N = 23$ ) were aged between 20 and 46 years old with a mean age of 33.26 ( $SD = 7.98$ ). A one-way ANOVA showed no significant difference in age between groups,  $F(1, 44) = .000, p = .985$ .

The demographics of ethnicity shows the total number and percentages of participants in each category (NZ European, NZ Maori, European, other), and for each group (control and drug). Ethnicity was similar in both groups with the majority, 65% of all participants (control group  $N = 14$ , drug group  $N = 16$ ), responding as New Zealand European, with 7% of all participants identifying as New Zealand Maori. There was a small difference between groups for those identifying as New Zealand Maori with  $N = 2$  (4.3%) in the control group and  $N = 5$  (10.9%) in the drug group.

Another difference was also noted for those identifying as European with  $N = 5$  (10.9%) in the control group and only  $N = 1$  (2.2%) in the drug group. Very little difference was found for those identifying as 'other' for ethnicity with only  $N = 2$  (4.3%) in the control group and  $N = 1$  (2.2%) in the drug group. Ethnicity for the drug group could be seen as a presentation of the those presenting for AOD treatment at the men's residential facility. When it came to recruitment of the control group, ethnicity was difficult to govern for.

For marital status (single, married or de-facto, in relationship) it can be seen in Table 1, that the majority of participants in both groups were 'single' with little difference found between each group: control group  $N = 11$  (23.9%) and drug group  $N = 15$  (32.6%), making a total of  $N = 26$  (56.5%) of all participants' marital status as 'single'. Very little difference was also noted for 'in relationship with  $N = 4$  (8.7%) in the control group and  $N = 5$  (10.9%) in the drug group.

However, there was a notable difference in ‘married’ participants with  $N = 8$  (17.4%) in the control group and only  $N = 3$  (6.5%) in the drug group.

For highest education level achieved (did not complete high school, completed high school, school certificate / NCEA1, certificate, diploma, degree, masters), there were considerable differences found between groups for these categories with  $N = 0$  of the control group compared to  $N = 7$  (15.2%) of the drug group having ‘not completed high school’. There were similarities found for ‘completed high school’ with  $N = 1$  (2.2%) of the control group compared to  $N = 3$  (6.5%) of the drug group; and ‘school certificate / NCEA1’ showing  $N = 6$  (13%) of the control group compared to  $N = 7$  (15.2%) of the drug group.

There were similar results found again between groups for ‘certificate’ with  $N = 3$  (6.5%) of the control group compared to  $N = 5$  (10.9%) of the drug group; and ‘diploma’ showing  $N = 4$  (8.7%) of the control group compared to  $N = 1$  (2.2%) of the drug group. There were larger differences found between groups for ‘degree’ which showed  $N = 6$  (13.0%) of the control group compared to  $N = 0$  of the drug group; and  $N = 3$  (6.5%) of the control group compared to  $N = 0$  of the drug group having obtained a ‘masters’. Overall, the control group had an increased prevalence of higher education qualifications.

Part of the criteria for the control group was for participants to have no history of drug use, drug addiction or problematic drug use, and no use of AOD services or facilities in any capacity. The inclusion criteria for the drug group was: (a) aged between 20 and 50 years old, (b) have a history of drug use of more than two years, (c) undergoing treatment for SUD at a residential AOD treatment facility at the time of data collection, (d) being detoxed by at least one week with verification by drug tests at the residential AOD facility, and (e) a current diagnosis from the residential AOD facility of a SUD as defined by the DSM-5.

## Medication

The medications reported by both groups were placed into the following categories: antidepressants, antipsychotics (quetiapine only), epileptic / anticonvulsant, and benzodiazepines and are displayed in Table 2.

Table 2

*Medications reported by the control and drug group.*

	Control Group	Drug Group
	N	N
Medication		
Anti-depressants	0	6
Anti-psychotic (quetiapine)	0	3
Anti-epileptic/convulsant	1	2
Benzodiazepines	0	1
No Medication	22	14

*Note: Three participants from the drug group were on more than one medication.*

## Substance of choice

Substances used (1<sup>st</sup> and 2<sup>nd</sup> choice) by the drug group were placed under the categories of alcohol, Cannabis, stimulants, benzodiazepines and opiates and are displayed in Table 3.

Table 3

*Comparisons on substance of choice for the drug group.*

	Substance of choice 1	Substance of choice 2
	N (%)	N (%)
N	23 (100%)	19 (82.6%)
Substance		
Alcohol	6 (26.1%)	2 (10.5%)
Cannabis	3 (13.0%)	9 (47.4%)
Stimulants	6 (26.1%)	7 (36.8%)
Benzodiazepines	2 (8.7%)	0
Opiates	6 (26.1%)	1 (5.3%)

## Measures

***Substance Use Disorder.*** All of the participants in the drug group met the DSM-5's criteria for SUD and were previously diagnosed by the AOD residential treatment facility prior to recruitment for this study. All participants recruited from the AOD facility met all the criteria for the drug group.

***Demographics.*** The demographic questionnaire consisting of eight questions which included age, ethnicity, marital status, education level, and current medications (the drug group were also asked what their main drug of choice or use was, and what other drugs they also used).



***Impulsivity.*** Personality facets of impulsivity were measured using the *revised* UPPS-P Impulsive Behavior Scale (Lynam et al., 2006). This questionnaire is a revised scale of the original UPPS Impulsivity Behavior Scale (Whiteside & Lynam, 2009) which was the result of exploratory and confirmatory factor analysis along with testing and reporting of internal consistency and external validity.

The UPPS-P Impulsive Behavior Scale (Lynam et al., 2006) questionnaire comprises of 59 items designed to measure five distinct personality facets of impulsivity behaviours. The items were rated on a 4-point scale - (1) agree strongly, (2) agree some, (3) disagree some, and (4) disagree strongly. Higher scores indicate greater impulsive behaviour. The scores for the UPPS-P Impulsive Behavior Scale (Lynam et al., 2006) are presented for each of the five subscales as follows:

- (a) Negative urgency (the tendency to experience and act upon strong impulses under conditions of negative affect), e.g., “When I feel bad, I will often do things I later regret in order to make myself feel better now”;
- (b) Lack of premeditation (a lack of ability to think and reflect on consequences of an action before engaging in it), e.g., “I like to stop and think things over before I do them”;
- (c) Lack of perseverance (difficulties remaining focused on a task that may be seen as long, boring, or difficult), e.g., “I tend to give up easily”;
- (d) Sensation-seeking (a tendency to enjoy and pursue exciting activities, and an openness to trying new experiences and sensations that may be risky or dangerous), e.g., “I’ll try anything once”; and

- (e) Positive urgency (tendency towards rash action in response to a very positive mood), e.g., “When I am very happy, I can’t seem to stop myself from doing things that can have bad consequences”.

***Attention Deficit Hyperactivity Disorder.*** The Adult ADHD Self-Report Scale (ASRS-v1.1) (Kessler et al., 2005) was used to determine if symptoms of ADHD were present and their severity. The questionnaire was designed to stimulate dialogue and is a self-report measure that consists of two parts totalling 18 questions taken from the diagnostic criteria of ADHD from the DSM-IV-TR. Six of the questions (Part A) are more predictive of the symptoms associated with ADHD, are clinically significant and are used as a screening instrument. Part B consists of a further 12 questions which provide additional cues into the symptoms and severity of ADHD.

Participants responded to all items of the Adult ADHD Self-Report Scale (ASRS-v1.1) (Kessler et al., 2005) on a five-point Likert scale (0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, 4 = *very often*). A response of 3 or 4 indicated that the symptom is clinically significant while for three items (*how often do you have trouble wrapping up the final details of a project, once the challenging parts have been done; how often do you have difficulty getting things in order when you have to do a task that requires organization; and how often do you have problems remembering appointments or obligations?*) a response of 2 is also clinically significant. The presence of adult ADHD is confirmed if the participant responds in the category of clinically significant for 4 more items in part A. This scale has been found to have a range of 0.63-0.72 for internal consistency reliability along with a range of 0.58-0.77 for (Pearson correlations) test-retest reliability (Torok et al., 2012).

## Procedure

The study and the procedures received approval from the University of Canterbury's Human Ethics Committee and the Clinical Director of the AOD treatment facility. Recruitment of the control group participants was from the general public which involved placing fliers around the University of Canterbury and other places such as libraries and public notice boards. The drug group participants were recruited at the residential AOD treatment facility where they were given a group presentation outlining what the study was about and what would be expected of them. All potential participants were provided with information about the study and all questions were answered. All participants were made aware that participation was completely voluntary and were under no pressure to participate. During the consenting process, all participants were assured of their anonymity and confidentiality throughout and following the study.

Both groups were informed that if they completed the study they would be given a \$20 voucher for a local supermarket. For the residential AOD treatment facility participants, a private consulting room was used at the facility. For the control group the interviews took place in private consulting room at the University of Canterbury. All participants were provided with written material by way of an information sheet (Appendix A and B) about the study and written consent (Appendix C) was obtained prior to commencement of any collection of data.

Once consent had been obtained in writing the interview process took place which involved the completion of three questionnaires in random order: the Demographics (Appendix D), the UPPS-P Impulsive Behavior Scale (Lynam et al., 2006) (Appendix E), and the Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist (Kessler et al., 2005) (Appendix F). Permission was sought and obtained for use of the Adult ADHD Self-Report Scale (ASRS-v1.1)

Symptom Checklist (Kessler et al., 2005) from the office of Dr Kessler at Harvard Medical School (Boston, USA).

The questionnaires were administered orally in the style of a clinical interview to ensure the questions were understood, and the researcher recorded the answers. The interviews took approximately 30 – 45 minutes to complete and participants were encouraged to seek assistance if the questions were unclear. All participants completed the same three questionnaires: (a) The demographic questionnaire; (b) The UPPS-P Impulsive Behavior Scale (Lynam et al., 2006) consisting of 59 consisting of five subscales that assess positive urgency, negative urgency, (lack of) premeditation, (lack of) perseverance and sensation seeking; and (c) The Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist (Kessler et al., 2005) involving 18 questions derived from the DSM-IV criteria for ADHD confirming the symptoms and measuring the severity of the symptoms of ADHD.

## **Analysis**

Data was analysed using IBM SPSS Statistics (Version 22.0) for Windows. Bivariate descriptive statistics were used to highlight the mean, standard deviation, and minimum and maximum on the continuous variables: age in years, negative urgency score, lack of premeditation score, lack of perseverance score, sensation score, positive urgency score, ADHD Part A score, and ADHD total of Part A and B score.

A one-way ANOVA was run to detect if there were any significant differences between groups on age in years. Chi-Square tests were not run on ethnicity, marital status, medication use (antidepressants, antipsychotics, anti-epileptic/anticonvulsant, benzodiazepines), or substances

used (alcohol, Cannabis, stimulants, benzodiazepines, opiates) due to low cell counts in several groups.

A MANOVA was run on ADHD Part A scores and ADHD total of Part A and B scores to compare the means across the two groups (drug and control). Then a MANOVA was run to determine if there were any significant differences between groups (drug and control) on impulsivity subscales (negative urgency, lack of premeditation, lack of perseverance, sensation seeking, positive urgency).

MANOVA's were also run on the drug group for the impulsivity subscales for those taking versus not taking medications, and those using versus not using stimulants and Cannabis. The same test was run on the ADHD measures for the continuous variables (i.e., subscale scores). Chi-Squared was run on the ADHD diagnosis (present, absent) and specific drug use (yes, no) to see if there was a relationship between the positive diagnosis of ADHD and a particular drug class. No data was excluded and there was no missing data.

## Results

### Impulsivity

Descriptive statistics for each group (control and drug) on the impulsivity subscales are shown in Table 4.

Table 4.

*Group comparisons for the five subscales of the UPPS-P Impulsive Behavior Scale (Lynam et al., 2006).*

	Control Group			Drug Group		
	<i>M</i> (SD)	Min.	Max.	<i>M</i> (SD)	Min.	Max.
Negative Urgency	2.25 (.66)	1.08	3.58	3.49 (.36)	2.58	4.00
Lack of Premeditation	2.12 (.56)	1.18	2.91	2.69 (.54)	1.73	3.73
Lack of Perseverance	1.96 (.49)	1.10	3.00	2.42 (.53)	1.20	3.40
Sensation Seeking	2.96 (.61)	2.00	3.83	3.37 (.51)	2.17	4.00
Positive Urgency	1.96 (.66)	1.14	3.50	3.10 (.63)	1.50	4.00

MANOVA showed a significant multivariate effect across group for the impulsivity scale,  $F(5, 40) = 11.83, p < .001, \eta_p^2 = .60$ . Univariate analysis showed the groups differed on Negative Urgency,  $F(1, 44) = 62.56, p < .001, \eta_p^2 = .59$ ; Lack of Premeditation,  $F(1, 44) = 12.61, p = .001, \eta_p^2 = .22$ ; Lack of Perseverance,  $F(1, 44) = 9.72, p = .003, \eta_p^2 = .81$ ; Sensation Seeking,  $F(1, 44) = 6.21, p = .017, \eta_p^2 = .12$ ; and Positive Urgency,  $F(1, 44) = 35.89, p < .001, \eta_p^2 = .45$ .

Isolating the drug group, MANOVA was run on the impulsivity subscales for those on medications versus not on any medications. There were no significant differences in multivariate effect  $F(5, 17) = 2.05, p = .122, \eta_p^2 = .38$ . A similar analysis on the drug group looking at differences in impulsivity subscales for those 1) using or not using stimulants, and 2) using and not using cannabis, also found no multivariate effects,  $F(5, 17) = .32, p = .895, \eta_p^2 = .09$ ,  $F(5, 17) = 1.17, p = .366, \eta_p^2 = .26$ , respectively.

## ADHD

Chi-squared analysis showed higher levels of ADHD diagnosis in the drug group (yes = 19, 83%; no = 4, 17%) than the control group (yes = 6, 26%; no = 17, 74%),  $\chi^2(1, N = 46) = 14.81, p < .001$ . Table 5 shows descriptive statistics for the ADHD scale.

Table 5.

*Group comparisons of the Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist (Kessler et al., 2005) for Part A, and the total of Part A and B.*

	Control Group			Drug Group		
	<i>M</i> (SD)	Min.	Max.	<i>M</i> (SD)	Min.	Max.
ADHD Part A	10.17 (4.33)	2.00	16.00	15.70 (3.82)	8.00	23.00
ADHD Part A & B	28.83 (10.54)	10.00	50.00	45.09 (9.65)	28.00	62.00

MANOVA compared groups (control and drug) for the ADHD scores for Part A and total of Part A and B. There was a multivariate effect,  $F(2, 43) = 14.76, p < .001, \eta_p^2 = .41$ . The drug group had higher scores on both Part A,  $F(1, 44) = 21.01, p < .001, \eta_p^2 = .32$ , and Parts A and B combined,  $F(1, 44) = 29.78, p < .001, \eta_p^2 = .40$ .

For the drug group alone, MANOVA was run on ADHD scores for Part A and total of Part A and B for those on medications versus not on any medications. There were no multivariate effect found,  $F(2, 20) = .08, p = .920, \eta_p^2 = .01$ .

Chi-Squared showed no significant relationship in the drug group for the ADHD diagnosis and stimulant use (ADHD+: yes = 19; no = 4; stimulant: yes = 10; no = 9),  $\chi^2(1, N = 23) = .67, p = .412$ , or Cannabis use (ADHD+: yes = 19; no = 4; Cannabis: yes = 11; no = 8),  $\chi^2(1, N = 23) = 1.43, p = .231$ .

MANOVA showed no significant multivariate effect on ADHD scores Part A and total of Part A and B for those using or not using stimulants,  $F(2, 20) = 1.16, p = .335, \eta_p^2 = .09$ ; and those using or not using Cannabis,  $F(2, 20) = 1.48, p = .251, \eta_p^2 = .13$ .



## Discussion

The aim of this study was to determine if a history of more than two years of alcohol or drug use and a current diagnosis of SUD is related to higher rates of impulsivity and ADHD, compared to age-matched men with no SUD history who had similar ethnicities and relationship statuses. Results supported the hypotheses that a history of alcohol and drug use along with a diagnosis of SUD is related to higher impulsive behaviours and symptoms of ADHD. These findings are supported and build on previous research on impulsive behaviours and ADHD in those with drug addictions (e.g., Kaye et al., 2013; Izquierdo & Jentsch, 2012; Weafer & Wit, 2013; Li et al., 2012). Although the results of this study show similar results to previous literature mentioned, this research looked at the subscales of impulsivity along with the symptoms of ADHD, and the effect they have on SUD.

The results supported the first hypothesis that SUD is related to higher ratings of impulsive behaviours. The drug group scored higher on all the subscales of the impulsivity behaviour scale: negative urgency, lack of premeditation, lack of perseverance, sensation seeking and positive urgency. Although the scores for the drug group were consistently higher on all subscales, negative and positive urgency scores were the highest for the drug group. Negative urgency is the tendency to feel and act upon strong impulses when experiencing conditions of negative effect, such as conflict with a significant other or work related stress. Whereas positive urgency is the desire to act upon strong impulses when in a very good mood. Both of these constructs demonstrate how an individual with elevated impulsive behaviours, would seek or engage in unhealthy and even dangerous actions such as illicit drug taking.

Those with higher rates of impulsivity are likely to take rash action when experiencing either negative or positive stimuli, regardless of whether it is internal or external. This rash action may make it difficult to disrupt or abort movement towards drug and alcohol use. The findings suggest that when a person with an addiction to drugs is experiencing times of stress that may be either internal or external, they are likely to engage in impulsive behaviour, which activates their drug taking. This has serious implications on relapsing when an individual may be controlling their drug intake or attempting a period of abstinence. Therefore, a relapse is likely if stress of any kind is experienced or not managed in other ways.

The results of this study also supported the second hypothesis that SUD is related to a higher prevalence of ADHD symptoms. The drug group scored significantly and consistently higher on both measures of the ADHD scale: Part A, and the total of Part A and B compared to the control group. It was also found that the drug group scored significantly higher than the control group for a positive diagnosis of ADHD. In addition to this, the results also demonstrated that the drug group, in which most participants were positive for the ADHD diagnosis, did not have a preference for any particular drug type. This could be interpreted that illicit drug users, with high symptomology of ADHD, do not have a preference or use a specific class of drugs for self-medication. Further research into this is needed. For example, a study that reports on the types of drugs being used by those with coexisting disorders of ADHD and SUD.

Finally, the results showed that for both groups (control and drug), there was no interaction between those taking and not taking medications. In the drug group neither medication use or specific substance use produced higher impulsivity or ADHD scores. This suggests impulsivity and ADHD symptoms are related to abusing substances generally, rather than a specific drug or medication use. There is a lot of research indicating that ADHD is related

to an earlier onset of drug use and higher severity of SUD (Kaye et al., 2013). Although it has been suggested that treatment of childhood ADHD may be beneficial with the prevention of illicit drug use in adulthood (Garcia, 2013). Unfortunately, diagnosis of ADHD is often overlooked, leaving the symptoms unmanaged and untreated psychologically or pharmacologically. Research also indicates that ADHD is not commonly diagnosed among those presenting for AOD treatment or with those diagnosed with SUD (Garcia, 2013).

### **Strengths and Limitations**

Future research on ADHD, impulsivity and SUD should control for education as this study showed there was a significant difference between the control group and the drug group. The control group had a higher education level. Whilst the sample were not representative, it is possible that the drug group participants who scored highly on ADHD symptoms, may have had the symptoms of ADHD as a child, which may or may not have been diagnosed, adequately managed, or treated. Functional impairments in academic achievement are also seen in those with ADHD (Molina et al., 2014).

Future work needs to examine, 1) the history of ADHD in SUD patients, 2) their impact on education, and 3) are these symptoms directly related to SUD development. A further limitation of this study is not controlling for Conduct Disorder (CD) which may play an important role in clarifying the connection between ADHD, impulsivity and SUD. In addition, ADHD shares similar features to CD therefore it would be worth controlling for CD in future studies as it has been found to be commonly diagnosed amongst substance users (Torok et al., 2012).

### **Considerations for future research**

It would be very useful for future studies to look more closely at the relationship between ADHD and impulsivity. Although impulsivity is a trait of ADHD, a diagnosis of ADHD alone does not fully explain the interaction between these two constructs. It could be found in future research that only specific traits of impulsive behaviour (e.g., negative urgency/delay discounting) are prevalent in those diagnosed with ADHD. Given that previous research on ADHD and SUD has shown there is positive outcomes for residential patients with coexisting disorders of ADHD and SUD using non-pharmacological treatment methods (Matthys et al., 2013), further research would certainly be worthwhile.

### **Implications for SUD assessment and treatment**

If providers of AOD treatment were to screen for ADHD symptoms and impulsive behaviours, it may guide and improve treatment strategies. This would then result in far more effective treatment and lower rates of relapse.

### **Conclusion**

With the severity of alcohol and drug addiction so high not only in New Zealand but worldwide, it is an area that is certainly worthy of further research. The costs are phenomenal both financially and for all involved. The current study has shown that impulsive behaviours and ADHD symptoms are indeed related to SUD and has built on previous research in this area. This research also looked at both impulsive behaviours and ADHD symptoms together, along with their effect on SUD. The finding of this study encourage future research to contribute further evidence towards the specific facets of impulsivity along with the symptoms of ADHD in those

with SUD. Such research will continue to guide assessment and treatment strategies for AOD workers and service providers. Improvements in these areas will result in fewer relapses, and consequently lower the costs on people and society.

## References

- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing. pp. 481.
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders*, (4th ed, text rev). doi:10.1176/appi.books.9780890423349
- Ashar, Y. K., Andrews-Hanna, J. R., Yarkoni, T., Sills, J., Halifax, J., Dimidjian, S. & Wager, T. D. (2016). Effects of compassion meditation on a psychological model of charitable donation. *Emotion*. Advance online publication.  
<http://dx.doi.org.ezproxy.canterbury.ac.nz/10.1037/emo0000119>
- Bornovalova, M. A., Daughters, S. B., Hernandez, G. D., Richards, J. B., & Lejuez, C. W. (2005). Differences in impulsivity and risk-taking propensity between primary users of crack cocaine and primary users of heroin in a residential substance-use program. *Experimental and Clinical Psychopharmacology*, 13(4), 311-318.
- Brevers, D., Cleeremans, A., Verbruggen, F., Bechara, A., Kornreich, C., Verbanck, P., & Noel, X. (2012). Impulse action but not impulse choice determines problem gambling severity. *PLOS ONE*, 7(11): e50647.
- Donohew, L., Zimmerman, R., Cupp, P. S., Novak, S., Colon, S., & Abell, R. (2000). Sensation seeking, impulsive decision-making, and risky sex: Implications for risk-taking and design of interventions. *Personality and Individual Differences*, 28 (2000), 1079-1091.
- el-Guebaly, N., Mudry, T., Zohar, J., Tavares, H., & Potenza, M. (2011). Compulsive features in behavioural addictions: the case of pathological gambling. *Addiction* (2011), 107, 1726-1734. doi:10.1111/j.1360-0443.2011.03546.x

- Eysenck, H. J. (1997). Addiction, Personality and Motivation. *Human Psychopharmacology*, 12, S79-S87.
- Fernando, A. B. P., Economidou, D., Theobald, D. E., Zou, M.F., Newman, A. H., Spoelder, M., Caprioli, D., Moreno, M., Hipolito, L., Aspinall, A. T., Robbins, T. W., & Dalley, J. W. (2011). Modulation of high impulsivity and attentional performance in rats by selective direct and indirect dopaminergic and noradrenergic receptor agonists. *Psychopharmacology* (2012), 219, 341-352. doi:10.1007/s00213-011-2408-z
- Friedman, I., Dar, R., & Shilony, E. (2000). Compulsivity and obsessionality in opioid addiction. *The Journal of Nervous and Mental Disease*, 188(3), 155-162. ISSN: 0022-3018.
- Garcia, F. D. (2013). Commentary on Kaye et al. (2013): Attention deficit disorder in substance use disorder – a hidden or a conspicuous comorbidity? What does it change for patients? *Addiction- Commentary*, 108, 932-933.
- Glass, K., & Flory, K. (2012). Are symptoms of ADHD related to substance use among college students? *Psychology of Addictive Behaviors*, 26(1), 124-132.
- Gruber, S. A., Silveri, M. M., Dahlgren, M. K., & Todd, D. Y. (2011). Why so impulsive? White matter alterations are associated with impulsivity in chronic marijuana smokers. *Experimental and Clinical Psychopharmacology*, 19(3), 231-242. doi:10.1037/a0023034
- Henden, E., Melberg, H. O., & Rogeberg, O. J. (2013). Addiction: choice or compulsion? *Frontiers in Psychiatry: Addictive Disorders and Behavioural Dyscontrol*, 4(77), 1-11. doi:10.3389/fpsy.2013.00077
- Heyman, G. M. (2013). Addiction and choice: theory and new data. *Frontiers in Psychiatry: Addictive Disorders and Behavioural Dyscontrol*, 4(31), 1-4. doi:10.3389/fpsyct.2013.00031

- Horner, B., Scheibe, K., & Stine, S. (1996). Cocaine abuse and attention-deficit hyperactivity disorder: Implications of adult symptomatology. *Psychology of Addictive Behaviors*, 10(1), 55-60. doi:10.1037/0893-164X.10.1.55
- Izquierdo, A., & Jentsch, D. (2012). Reversal learning as a measure of impulsive and compulsive behaviour in addictions. *Psychopharmacology* (2012), 219, 607-620.  
doi:10.1007/s00213-011-2579-7
- Kaye, S., Darke, S., & Torok, M. (2013). Attention deficit hyperactivity disorder (ADHD) among illicit psychostimulant users: A hidden disorder? *Addiction*, 108, 923-931.
- Keith, J. R., Rapgay, L., Theodore, D., Schwartz, J. M., & Ross, J. L. (2015). An assessment of an automated EEG biofeedback system for attention deficits in a substance use disorders residential treatment setting. *Psychology of Addictive Behaviors*, 29(1), 17-25.  
doi:10.1037/adb0000016
- Kerr, J. S. (1996). Two myths of addiction: The addictive personality and the issue of free choice. *Human Psychopharmacology*, 11, S9-S13.
- Kessler, R.C., Adler, L., Ames, M., Demler, O., Faraone, S., Hiripi, E., Howes, M.J., Jin, R., Secnik, K., Spencer, T., Ustun, T.B., & Walters, E.E. (2005). The World Health Organization Adult ADHD Self-Report Scale (ASRS). *Psychological Medicine*, 35(2), 245-256.
- Kessler, R. C., Adler, L., Barley, R., Biederman, J., Conners, C. K., Demler, O., et al. (2006). The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *The American Journal of Psychiatry*, 163(4), 716-723. doi:10.1176/appi.ajp.163.4.716



- Li, T., Du, J., Yu, S., Jiang, H., Fu, Y., Wang, D., Sun, H., Chen, H., & Zhao, M. (2012). Pathways to age of onset of heroin use: A structural model approach exploring the relationship of the COMT gene, impulsivity and childhood trauma. *PLoS ONE*, 7(11): e48735. doi:10.1371/journal.pone.0048735
- Liu, R. T., Vassileva, J., Gonzalez, P., & Martin, E. M. (2012). A comparison of delay discounting among substance users with and without suicide attempt history. *Psychology of Addictive Behaviors*, 26(4), 980-985.
- Lynam, D. R., Smith, G. T., Whiteside, S.P., & Cyders, M. A. (2006). The UPPS-P: Assessing five personality pathways to impulsive behaviour. West Lafayette, IN: Purdue University.
- Matthys, F., Joostens, P., Stes, S., Tremmery, S., & Sabbe, B. (2013). The construction of the first validated (evidence based) guideline for dual diagnosis of ADHD and SUD; Data from focus groups. *Int J Ment Health Addiction* (2013), 11:557-567. doi:10.1007/s11469-013-9438-1
- Molina, B. S. G., Walther, C. A. P., Cheong, J. W., Pedersen, S. L., Gnagy, E. M., & Pelham, Jr, W. E. (2014). Heavy alcohol use in early adulthood as a function of childhood ADHD: Developmentally specific mediation by social impairment and delinquency. *Experimental and Clinical Psychopharmacology*, 22(2), 110-121.
- Moody, L., Franck, C., Hatz, L., & Bickel, W. K. (2016). Impulsivity and polysubstance use: A systematic comparison of delay discounting in mono-, dual-, and trisubstance use. *Experimental and Clinical Psychopharmacology*, 24(1), 30-37. doi:10.1037/pha0000059
- Torok, M., Darke, S., & Kaye, S. (2012). Attention Deficit Hyperactivity Disorder and severity of substance use: The role of comorbid psychopathology. *Psychology of Addictive Behaviors*, 26(4), 974-979.

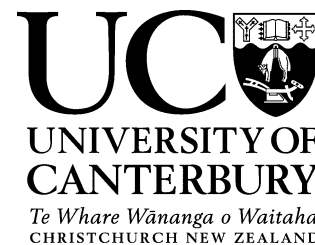
- Voon, V., Reynolds, B., Brezing, C., Gallea, C., Skaljic, M., Ekanayake, V., Fernandez, H., Potenza, M. N., Dolan, R. J., & Hallett, M. (2010). Impulsive choice and response in dopamine agonist-related impulse control behaviors. *Psychopharmacology (2010)*, 207, 645-659. doi:10.1007/s00213-009-1697-y
- Weafer, J., & de Wit, H. (2013). Sex differences in impulse action and impulse choice. *Addictive Behaviors (2013)*, <http://dx.doi.org/10.1016/j.addbeh.2013.10.033>
- Whiteside, S. P., & Lynam, D. R. (2009). Understanding the role of impulsivity and externalizing psychopathology in alcohol abuse: Application of the UPPS impulsive behaviour scale. *Personality Disorders: Theory, Research, and Treatment*, S(1), Aug, 2009, 69-79. doi:10.1037/1949-2715.S.1.69
- Zigmond, D. (2012). The medical model – its limitations and alternatives [Web log post]. Retrieved from <http://www.marco-learning-systems.com/pages/david-zigmond/medical-model.htm>

## Appendix A

(control group)

### College of Science

Department of Psychology  
Tel: +64 3 364 2382, Fax: + 64 364 2181  
Email: sjm346@uclive.ac.nz



Date \_\_\_\_\_

### **“The effect that ADHD symptoms and impulsivity have on drug addiction”**

**Information Sheet for** \_\_\_\_\_

My name is Suzanne McLaughlin. I am a Masters Thesis student at the University of Canterbury in Christchurch working under the supervision of Associate Professor Martin Dorahy and Dr Juan Canales. I am trying to understand more about drug use and dependence by conducting a study in which I gather information (data) from participants by asking questions and inviting them to complete questionnaires.

This research will explore the impact that Attention Deficit Hyperactivity Disorder (ADHD) symptoms and impulse behaviours have on drug addiction. Other demographic factors will also be recorded such as gender and ethnicity. It is intended that this research will provide useful information for practitioners working in the alcohol / drug field which may improve assessment tools and guide treatment strategies.

As part of this project I will be collecting data from participants' by inviting them to complete a short demographic questionnaire and two other questionnaires on ADHD symptoms and impulsivity. This will be done in the style of an interview.

If you would like to be involved, an appointment will be made with you at the University of Canterbury in a private consulting room. I will read the questions out to you and record your answers. There will be an opportunity to review your answers at the conclusion of the interview, however no feedback on your answers or diagnoses will be offered. It is estimated that collecting the data may take up to one hour. On completion of the questionnaires, you will be given a \$20 voucher redeemable at New World Supermarkets as a thank you for participating in this research.

### The use of your information

Participation is voluntary and you have the right to withdraw at any stage without penalty. If you withdraw, all information relating to you will be removed. However, once the research has been completed and all the data merged together it will not be possible to remove your data as it will be anonymously placed in a data file.

To ensure anonymity and confidentiality, your name will not be written on the questionnaires. Instead you will be assigned an identity number and this number will be written on your questionnaires.

The completed questionnaires' and consent form will be locked in separate cabinets in my supervisor's university office (Martin Dorahy). The questionnaires, consent form and computerised data will be destroyed after five years in compliance with university requirements.

A thesis is a public document and will be made available through the UC Library. The results of the project may be published, but you may be assured of the complete confidentiality of data gathered in this research. Your identity will only be known by the researcher Suzanne McLaughlin and will not be made public.

The project is being carried out as a requirement of completing a Masters degree in Science (Psychology) by Suzanne McLaughlin the principal researcher under the supervision of Associate Professor Martin Dorahy and Dr Juan Canales. Suzanne McLaughlin can be contacted on phone number: 03 364 2382 or email: [sjm346@uclive.ac.nz](mailto:sjm346@uclive.ac.nz), and Martin Dorahy on phone number: 03 364 3416 or email: [martin.dorahy@canterbury.ac.nz](mailto:martin.dorahy@canterbury.ac.nz). They will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to: The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch or email: [human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz).

You may receive a copy of the research results at the conclusion of the project by indicating this on the consent form.

If you agree to participate in the study, you are asked to complete the consent form with the researcher Suzanne McLaughlin.

---

***Suzanne McLaughlin***  
Masters Thesis Student  
University of Canterbury

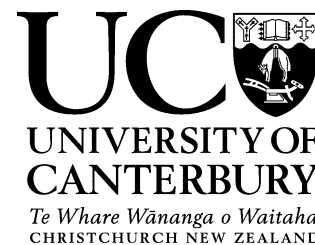
***Martin Dorahy***  
Associate Professor  
University of Canterbury

## Appendix B

(drug group)

### College of Science

Department of Psychology  
Tel: +64 3 364 2382, Fax: + 64 364 2181  
Email: sjm346@uclive.ac.nz



Date \_\_\_\_\_

### **“The effect that ADHD symptoms and impulsivity have on drug addiction”**

**Information Sheet for** \_\_\_\_\_

My name is Suzanne McLaughlin. I am a Masters Thesis student at the University of Canterbury in Christchurch working under the supervision of Associate Professor Martin Dorahy and Dr Juan Canales. I am trying to understand more about drug use and dependence by conducting a study in which I gather information (data) from participants by asking questions and inviting them to complete questionnaires.

This research will explore the impact that Attention Deficit Hyperactivity Disorder (ADHD) symptoms and impulse behaviours have on drug addiction. Other demographic factors will also be recorded such as gender and ethnicity. It is intended that this research will provide useful information for practitioners working in the alcohol / drug field which may improve assessment tools and guide treatment strategies.

As part of this project I will be collecting data from participants' by inviting them to complete a short demographic questionnaire and two other questionnaires on ADHD symptoms and impulsivity. This will be done in the style of an interview.

If you would like to be involved, an appointment will be made with you at Odyssey House in a private consulting room. I will read the questions out to you and record your answers. There will be an opportunity to review your answers at the conclusion of the interview, however no feedback on your answers or diagnoses will be offered. It is estimated that collecting the data may take up to one hour. On completion of the questionnaires, you will be given a \$20 voucher redeemable at New World Supermarkets as a thank you for participating in this research.

### The use of your information

Participation is voluntary and you have the right to withdraw at any stage without penalty. If you withdraw, all information relating to you will be removed. However, once the research has been completed and all the data merged together it will not be possible to remove your data as it will be anonymously placed in a data file.

To ensure anonymity and confidentiality, your name will not be written on the questionnaires. Instead you will be assigned an identity number and this number will be written on your questionnaires.

The completed questionnaires' and consent form will be locked in separate cabinets in my supervisor's university office (Martin Dorahy). The questionnaires, consent form and computerised data will be destroyed after five years in compliance with university requirements.

A thesis is a public document and will be made available through the UC Library. The results of the project may be published, but you may be assured of the complete confidentiality of data gathered in this research. Your identity will only be known by the researcher Suzanne McLaughlin and will not be made public.

The project is being carried out as a requirement of completing a Masters degree in Science (Psychology) by Suzanne McLaughlin the principal researcher under the supervision of Associate Professor Martin Dorahy and Dr Juan Canales. Suzanne McLaughlin can be contacted on phone number: 03 364 2382 or email: [sjm346@uclive.ac.nz](mailto:sjm346@uclive.ac.nz), and Martin Dorahy on phone number: 03 364 3416 or email: [martin.dorahy@canterbury.ac.nz](mailto:martin.dorahy@canterbury.ac.nz). They will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to: The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch or email: [human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz).

You may receive a copy of the research results at the conclusion of the project by indicating this on the consent form.

If you agree to participate in the study, you are asked to complete the consent form with the researcher Suzanne McLaughlin.

---

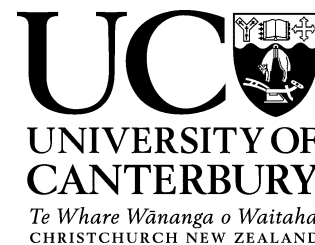
***Suzanne McLaughlin***  
Masters Thesis Student  
University of Canterbury

***Martin Dorahy***  
Associate Professor  
University of Canterbury

## Appendix C

### College of Science

Department of Psychology  
Tel: +64 3 364 2382, Fax: + 64 364 2181  
Email: [sjm346@uclive.ac.nz](mailto:sjm346@uclive.ac.nz)



### **“The effect that ADHD symptoms and impulsivity have on drug addiction”**

#### **Consent Form for \_\_\_\_\_**

I have been given a full explanation of this project and I have had the opportunity to ask questions. I understand that participation is voluntary and I may withdraw at any time prior to my data being merged with other data.

I understand that any information or opinions I provide will be kept confidential to the researcher and the supervisor and that any published or reported results will not identify me. I understand that a thesis is a public document and will be available through the UC Library.

I understand that all data collected for the study will be kept in locked secure facilities and password protected electronic form, and will be destroyed after five years. I understand the risks associated with taking part and how they will be managed.

I understand that if I require further information I can contact the researcher Suzanne McLaughlin on phone number: 03 364 2382 or email: [sjm346@uclive.ac.nz](mailto:sjm346@uclive.ac.nz), or the supervisor Martin Dorahy on phone number: 03 364 3416 or email: [martin.dorahy@canterbury.ac.nz](mailto:martin.dorahy@canterbury.ac.nz).

If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch or email: [human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz).

☐ Please tick if you would like to receive a copy of the report outlining the findings of the study by post or email to the following address:

---

By signing below, I understand what is required of me and I agree to participate in this research.

---

Signature

Name

Date

## Appendix D

RE: Permission to use the ASRS-V1.1 in a New Zealand study

From: Borreliz, Avery [Borreliz@hcp.med.harvard.edu]

Sent: Sat 11/04/2015 5:32 a.m.

To: Suzanne McLaughlin

Thank you for contacting Dr. Kessler regarding the use of the ADHD-ASRS v1.1. Use of the ASRS is free and does not require any formal permission or approval. We do, however, ask that you please cite the below article when using the ASRS. Should you publish any work that uses the ASRS, please send us the citations to all final publications.

Kessler, R.C., Adler, L., Ames, M., Demler, O., Faraone, S., Hiripi, E., Howes, M.J., Jin, R., Secnik, K., Spencer, T., Ustun, T.B., Walters, E.E. (2005). The World Health Organization Adult ADHD Self-Report Scale (ASRS). *Psychological Medicine*, 35(2), 245-256

Should you make any amendments to the ASRS, please be sure to indicate those changes as being unique to your replication of the instrument. Please feel free to follow-up with me should you have any additional questions regarding the use of the ASRS.

Kind regards,  
Avery Borreliz

**Avery Borreliz**  
Research Assistant  
Department of Health Care Policy  
Harvard Medical School  
180A Longwood Ave.  
Boston, MA 02115

617-432-2634  
[Borreliz@hcp.med.harvard.edu](mailto:Borreliz@hcp.med.harvard.edu)



## Appendix E

### Demographics

Participant ID:	Date:
Researcher:	

**Gender:** Male / Female / Other

**Age:** \_\_\_\_\_

**Ethnicity:** (you may circle more than one)

NZ European / NZ Maori / European / Other: \_\_\_\_\_

**Marital Status:** Single / Married or De-facto / In Relationship

**Education level:** Didn't complete High School / Completed High School / School

Certificate or NCEA1 / Certificate / Diploma / Degree / Masters

**Current medications:** \_\_\_\_\_

---

*Drug group only*

**1<sup>st</sup> Substance of Choice:** \_\_\_\_\_

**2<sup>nd</sup> Substance of Choice:** \_\_\_\_\_

## Appendix F

### UPPS-P Impulsive Behavior Scale

Below are a number of statements that describe ways in which people act and think. For each statement, please indicate how much you agree or disagree with the statement. If you **Agree Strongly** circle **1**, if you **Agree Somewhat** circle **2**, if you **Disagree Somewhat** circle **3**, and if you **Disagree Strongly** circle **4**. Be sure to indicate your agreement or disagreement for every statement below.

	<b>Agree Strongly</b>	<b>Agree Some</b>	<b>Disagree Some</b>	<b>Disagree Strongly</b>
1. I have a reserved and cautious attitude toward life.	1	2	3	4
2. I have trouble controlling my impulses.	1	2	3	4
3. I generally seek new and exciting experiences and sensations.	1	2	3	4
4. I generally like to see things through to the end.	1	2	3	4
5. When I am very happy, I can't seem to stop myself from doing things that can have bad consequences.	1	2	3	4
6. My thinking is usually careful and purposeful.	1	2	3	4
7. I have trouble resisting my cravings (for food, cigarettes, etc.).	1	2	3	4
8. I'll try anything once.	1	2	3	4
9. I tend to give up easily.	1	2	3	4
10. When I am in great mood, I tend to get into situations that could cause me problems.	1	2	3	4
11. I am not one of those people who blurt out things without thinking.	1	2	3	4
12. I often get involved in things I later wish I could get out of.	1	2	3	4
13. I like sports and games in which you have to choose your next move very quickly.	1	2	3	4
14. Unfinished tasks really bother me.	1	2	3	4
15. When I am very happy, I tend to do things that may cause problems in my life.	1	2	3	4
16. I like to stop and think things over before I do them.	1	2	3	4
17. When I feel bad, I will often do things I later regret in order to make myself feel better now.	1	2	3	4
18. I would enjoy water skiing.	1	2	3	4
19. Once I get going on something I hate to stop.	1	2	3	4
20. I tend to lose control when I am in a great mood.	1	2	3	4
21. I don't like to start a project until I know exactly how to proceed.	1	2	3	4

	Agree Strongly	Agree Some	Disagree Some	Disagree Strongly
22. Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse.	1	2	3	4
23. I quite enjoy taking risks.	1	2	3	4
24. I concentrate easily.	1	2	3	4
25. When I am really ecstatic, I tend to get out of control.	1	2	3	4
26. I would enjoy parachute jumping.	1	2	3	4
27. I finish what I start.	1	2	3	4
28. I tend to value and follow a rational, "sensible" approach to things.	1	2	3	4
29. When I am upset I often act without thinking.	1	2	3	4
30. Others would say I make bad choices when I am extremely happy about something.	1	2	3	4
31. I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.	1	2	3	4
32. I am able to pace myself so as to get things done on time.	1	2	3	4
33. I usually make up my mind through careful reasoning.	1	2	3	4
34. When I feel rejected, I will often say things that I later regret.	1	2	3	4
35. Others are shocked or worried about the things I do when I am feeling very excited.	1	2	3	4
36. I would like to learn to fly an airplane.	1	2	3	4
37. I am a person who always gets the job done.	1	2	3	4
38. I am a cautious person.	1	2	3	4
39. It is hard for me to resist acting on my feelings.	1	2	3	4
40. When I get really happy about something, I tend to do things that can have bad consequences.	1	2	3	4
41. I sometimes like doing things that are a bit frightening.	1	2	3	4
42. I almost always finish projects that I start.	1	2	3	4
43. Before I get into a new situation I like to find out what to expect from it.	1	2	3	4
44. I often make matters worse because I act without thinking when I am upset.	1	2	3	4
45. When overjoyed, I feel like I can't stop myself from going overboard.	1	2	3	4

*Please go to the next page*

	<b>Agree Strongly</b>	<b>Agree Some</b>	<b>Disagree Some</b>	<b>Disagree Strongly</b>
46. I would enjoy the sensation of skiing very fast down a high mountain slope.	1	2	3	4
47. Sometimes there are so many little things to be done that I just ignore them all.	1	2	3	4
48. I usually think carefully before doing anything.	1	2	3	4
49. When I am really excited, I tend not to think of the consequences of my actions.	1	2	3	4
50. In the heat of an argument, I will often say things that I later regret.	1	2	3	4
51. I would like to go scuba diving.	1	2	3	4
52. I tend to act without thinking when I am really excited.	1	2	3	4
53. I always keep my feelings under control.	1	2	3	4
54. When I am really happy, I often find myself in situations that I normally wouldn't be comfortable with.	1	2	3	4
55. Before making up my mind, I consider all the advantages and disadvantages.	1	2	3	4
56. I would enjoy fast driving.	1	2	3	4
57. When I am very happy, I feel like it is ok to give in to cravings or overindulge.	1	2	3	4
58. Sometimes I do impulsive things that I later regret.	1	2	3	4
59. I am surprised at the things I do while in a great mood.	1	2	3	4

Participant ID:	Date:
Researcher:	

## Scoring Instructions

This is a revised version of the UPPS Impulsive Behavior scale (Whiteside & Lynam, 2001). This version, UPPS-P (Lynam, Smith, Whiteside, & Cyders, 2006), assesses Positive Urgency (Cyders, Smith, Spillane, Fischer, Annus, & Peterson, 2007) in addition to the four pathways assessed in the original version of the scale-- Urgency (now Negative Urgency), (lack of) Premeditation, (lack of) Perseverance, and Sensation Seeking. The scale uses a 1 (agree strongly) to 4 (disagree strongly) response format. Because the items from different scales run in different directions, it is important to make sure that the correct items are reverse-scored. We suggest making all of the scales run in the direction such that higher scores indicate more impulsive behavior. Therefore, we include the scoring key for, (Negative) Urgency, (lack of) Premeditation, (lack of) Perseverance, Sensation Seeking, and Positive Urgency. For each scale, calculate the mean of the available items; this puts the scales on the same metric. We recommend requiring that a participant have at least 70% of the items before a score is calculated.

(Negative) Urgency (all items except 1 are reversed)

items 2 (R), 7(R), 12 (R), 17 (R), 22 (R), 29 (R), 34 (R), 39 (R), 44 (R), 50 (R), 53, 58 (R)

(lack of) Premeditation (no items are reversed)

items 1, 6, 11, 16, 21, 28, 33, 38, 43, 48, 55.

(lack of) Perseverance (two items are reversed)

items 4, 9 (R), 14, 19, 24, 27, 32, 37, 42, 47 (R)

Sensation Seeking (all items are reversed)

items 3 (R), 8 (R), 13 (R), 18 (R), 23 (R), 26 (R), 31 (R), 36 (R), 41 (R), 46 (R), 51 (R), 56 (R)

Positive Urgency (all items are reversed)

items 5 (R), 10 (R), 15 (R), 20 (R), 25 (R), 30 (R), 35 (R), 40 (R), 45 (R), 49 (R), 52 (R), 54 (R), 57 (R), 59 (R)

(R) indicates the item needs to be reverse scored such 1=4, 2=3, 3=2, and 4=1.

## Appendix G

### Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Please answer the questions below, rating yourself on what best describes how you have felt and conducted yourself over the past 6 months. Please give this completed checklist to your healthcare professional to discuss during today's appointment.

Ratings: Never, Rarely, Sometimes, Often, Very often.

#### Part A

1. How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?
2. How often do you have difficulty getting things in order when you have to do a task that requires organization?
3. How often do you have problems remembering appointments or obligations?
4. When you have a task that requires a lot of thought, how often do you avoid or delay getting started?
5. How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?
6. How often do you feel overly active and compelled to do things, like you were driven by a motor?

#### Part B

7. How often do you make careless mistakes when you have to work on a boring or difficult project?
8. How often do you have difficulty keeping your attention when you are doing boring or repetitive work?
9. How often do you have difficulty concentrating on what people say to you, even when they are speaking to you directly?
10. How often do you misplace or have difficulty finding things at home or at work?
11. How often are you distracted by activity or noise around you?
12. How often do you leave your seat in meetings or other situations in which you are expected to remain seated?

13. How often do you feel restless or fidgety?
14. How often do you have difficulty unwinding and relaxing when you have time to yourself?
15. How often do you find yourself talking too much when you are in social situations?
16. When you're in a conversation, how often do you find yourself finishing the sentences of the people you are talking to, before they can finish them themselves?
17. How often do you have difficulty waiting your turn in situations when turn taking is required?
18. How often do you interrupt others when they are busy?

### **The Value of Screening for Adults with ADHD**

Research suggests that the symptoms of ADHD can persist into adulthood, having a significant impact on the relationships, careers, and even the personal safety of your patients who may suffer from it.<sup>1-4</sup> Because this disorder is often misunderstood, many people who have it do not receive appropriate treatment and, as a result, may never reach their full potential. Part of the problem is that it can be difficult to diagnose, particularly in adults.

The Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist was developed in conjunction with the World Health Organization (WHO), and the Workgroup on Adult ADHD that included the following team of psychiatrists and researchers:

- Lenard Adler, MD Associate Professor of Psychiatry and Neurology New York University Medical School
- Ronald C. Kessler, PhD Professor, Department of Health Care Policy Harvard Medical School
- Thomas Spencer, MD Associate Professor of Psychiatry Harvard Medical School As a healthcare professional, you can use the ASRS v1.1 as a tool to help screen for ADHD in adult patients. Insights gained through this screening may suggest the need for a more in-depth clinician interview. The questions in the ASRS v1.1 are consistent with DSM-IV criteria and address the manifestations of ADHD symptoms in adults. Content of the questionnaire also reflects the importance that DSM-IV places on symptoms, impairments, and history for a correct diagnosis.<sup>4</sup>

The checklist takes about 5 minutes to complete and can provide information that is critical to supplement the diagnostic process.

References: 1. Schweitzer JB, et al. Med Clin North Am. 2001;85(3):10-11, 757-777. 2. Barkley RA. Attention Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment. 2nd ed. 1998. 3. Biederman J, et al. Am J Psychiatry. 1993;150:1792-1798. 4. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision. Washington, DC, American Psychiatric Association. 2000: 85-93.

## **Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist Instructions**

The questions on the back page are designed to stimulate dialogue between you and your patients and to help confirm if they may be suffering from the symptoms of attention-deficit/hyperactivity disorder (ADHD).

Description: The Symptom Checklist is an instrument consisting of the eighteen DSM-IV-TR criteria. Six of the eighteen questions were found to be the most predictive of symptoms consistent with ADHD. These six questions are the basis for the ASRS v1.1 Screener and are also Part A of the Symptom Checklist. Part B of the Symptom Checklist contains the remaining twelve questions.

Instructions:

### **Symptoms**

1. Ask the patient to complete both Part A and Part B of the Symptom Checklist by marking an X in the box that most closely represents the frequency of occurrence of each of the symptoms.
2. Score Part A. If four or more marks appear in the darkly shaded boxes within Part A then the patient has symptoms highly consistent with ADHD in adults and further investigation is warranted.
3. The frequency scores on Part B provide additional cues and can serve as further probes into the patient's symptoms. Pay particular attention to marks appearing in the dark shaded boxes. The frequency-based response is more sensitive with certain questions. No total score or diagnostic likelihood is utilized for the twelve questions. It has been found that the six questions in Part A are the most predictive of the disorder and are best for use as a screening instrument.

### **Impairments**

1. Review the entire Symptom Checklist with your patients and evaluate the level of impairment associated with the symptom.
2. Consider work/school, social and family settings.
3. Symptom frequency is often associated with symptom severity; therefore, the Symptom Checklist may also aid in the assessment of impairments. If your patients have frequent symptoms, you may want to ask them to describe how these problems have affected the ability to work, take care of things at home, or get along with other people such as their spouse/significant other.

### **History**

1. Assess the presence of these symptoms or similar symptoms in childhood. Adults who have ADHD need not have been formally diagnosed in childhood. In evaluating a patient's history, look for evidence of early-appearing and long-standing problems with attention or self-control. Some significant symptoms should have been present in childhood, but full symptomology is not necessary.